Stoller
Hanford Office

DOE-EM/GJ951-2005

299-W11-68 (A7310)
Log Data Report

Borehole Information:

Borehole:	299-W11-68 (A7310)		Site:	216-T-15 Trench	
Coordinates (WA St Plane)		GWL[1] (ft) :	None	GWL Date:	06/20/05
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
136782.453	566970.884	10/53	701.15	108	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.7	8 5/8	8	5/16	2.7	108

Borehole Notes:

Casing diameter and casing stickup measurements were acquired by the logging engineer using a caliper and steel tape. Measurements were rounded to the nearest 1/16 in.

Logging Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34TP40587A
Effective Calibration Date:	03/04/05	Calibration Reference:	DOE/EM-GJ854-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	08/08/05	08/08/05			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	108.0	3.0			
Finish Depth (ft)	3.0	13.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A			
Pre-Verification	AE090CAB	AE090CAB			
Start File	AE090000	AE090106			
Finish File	AE090105	AE090116			
Post-Verification	AE090CAA	AE090CAA			
Depth Return Error (in.)	N/A	N/A			

Log Run	1	2 Repeat			
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	08/19/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after the day's data acquisition. The acceptance criteria were met.

A casing correction for 0.3125-in.-thick casing was applied to the log data.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1EMar05.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. No corrections for dead time or water were necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections.

Historical total gamma logs acquired in 1963 and 1976 and derived from Additon et al. (1978) were re-digitized and included for comparison with the current log data. A repeat log section is also included.

Results and Interpretations:

^{137}Cs was the man-made radionuclide detected in this borehole. ^{137}Cs was detected between the ground surface and 8 ft; the maximum concentration was measured at approximately 230 pCi/g at 4 ft. ^{137}Cs was also detected at a few sporadic locations throughout the borehole near the MDL of approximately 0.2 pCi/g. ^{137}Cs was detected at the bottom of the borehole (108 ft) at 0.6 pCi/g.

An historical log acquired in 1963 indicates possible man-made radionuclide contamination near the ground surface and between 35 and 40 ft. By 1976, the elevated activity between 35 and 40 ft apparently decayed to near background levels. The 1976 total gamma log is consistent with the activity observed in the current SGLS total gamma profile.

The repeat section generally indicates good agreement of the naturally occurring KUT and ^{137}Cs concentrations.

References:

Additon, M.K., K.R. Fecht, T.L. Jones, and G.V. Last, 1978. *Scintillation Probe Profiles From 200 East Area Crib Monitoring Well*s, RHO-LD-28, Rockwell Hanford Operations, Richland, Washington.

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, Pacific Northwest Laboratory, Richland, Washington.

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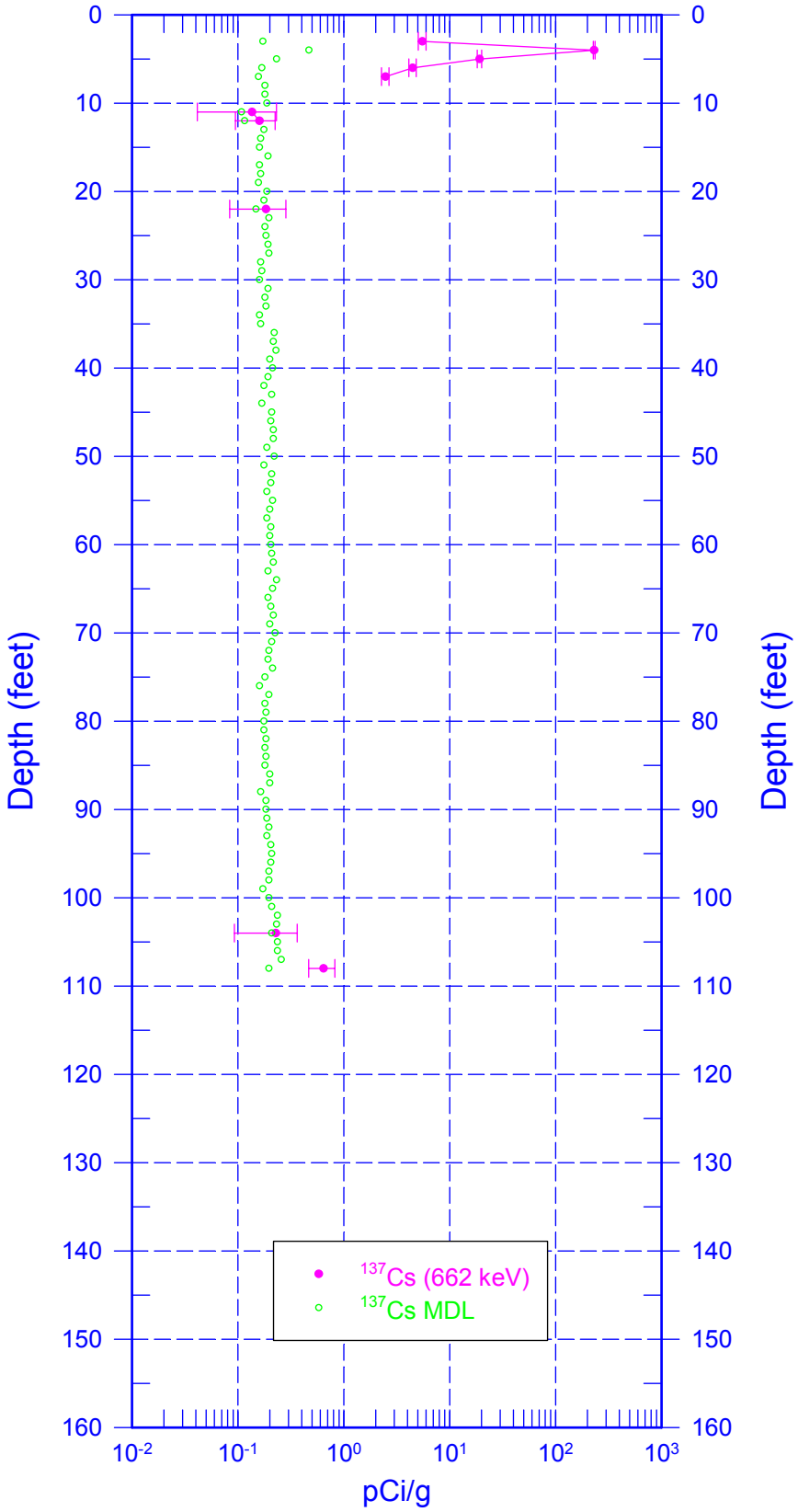
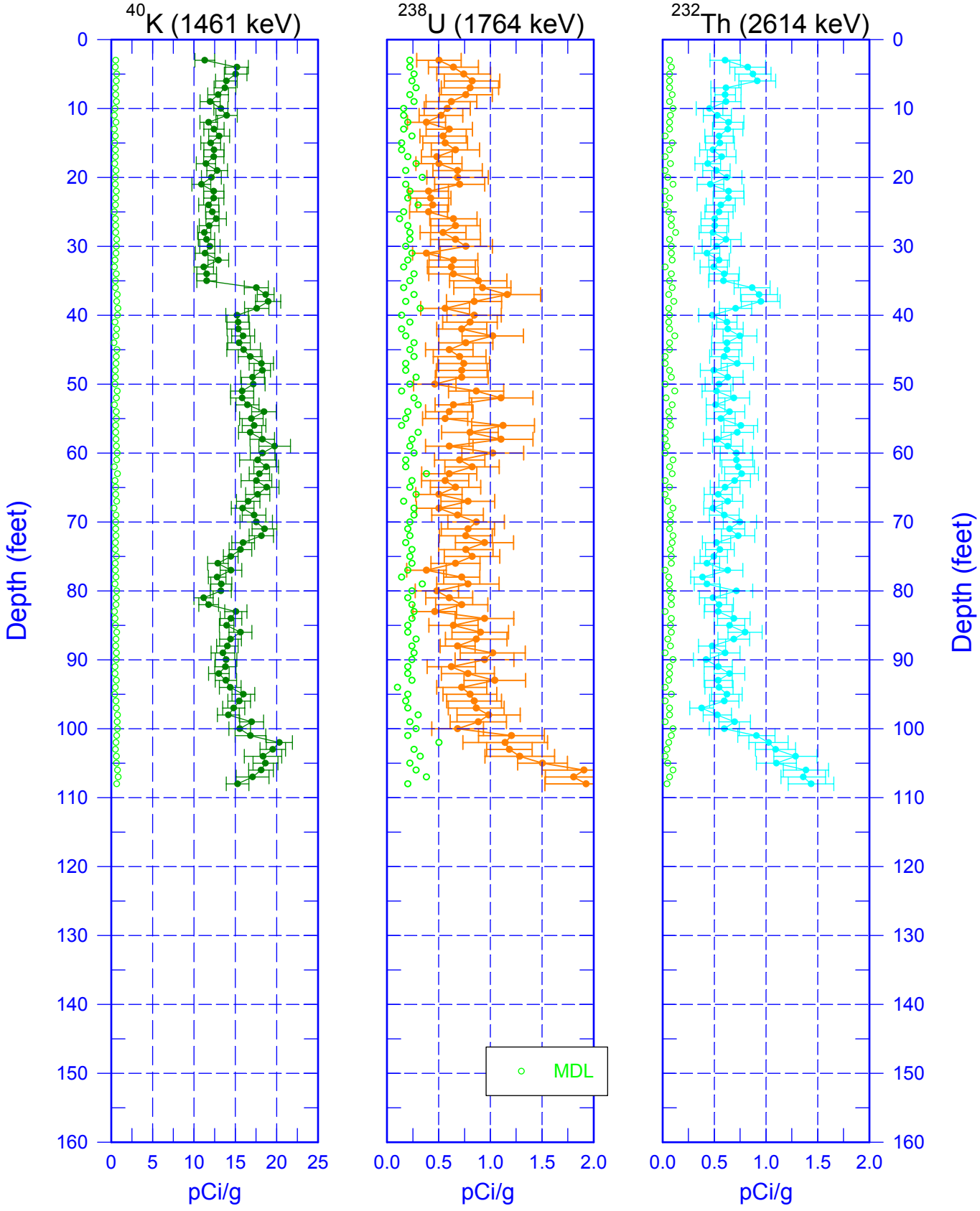
[1] GWL – groundwater level
[2] N/A – not applicable

299-W11-68 (A7310)
Man-Made Radionuclides



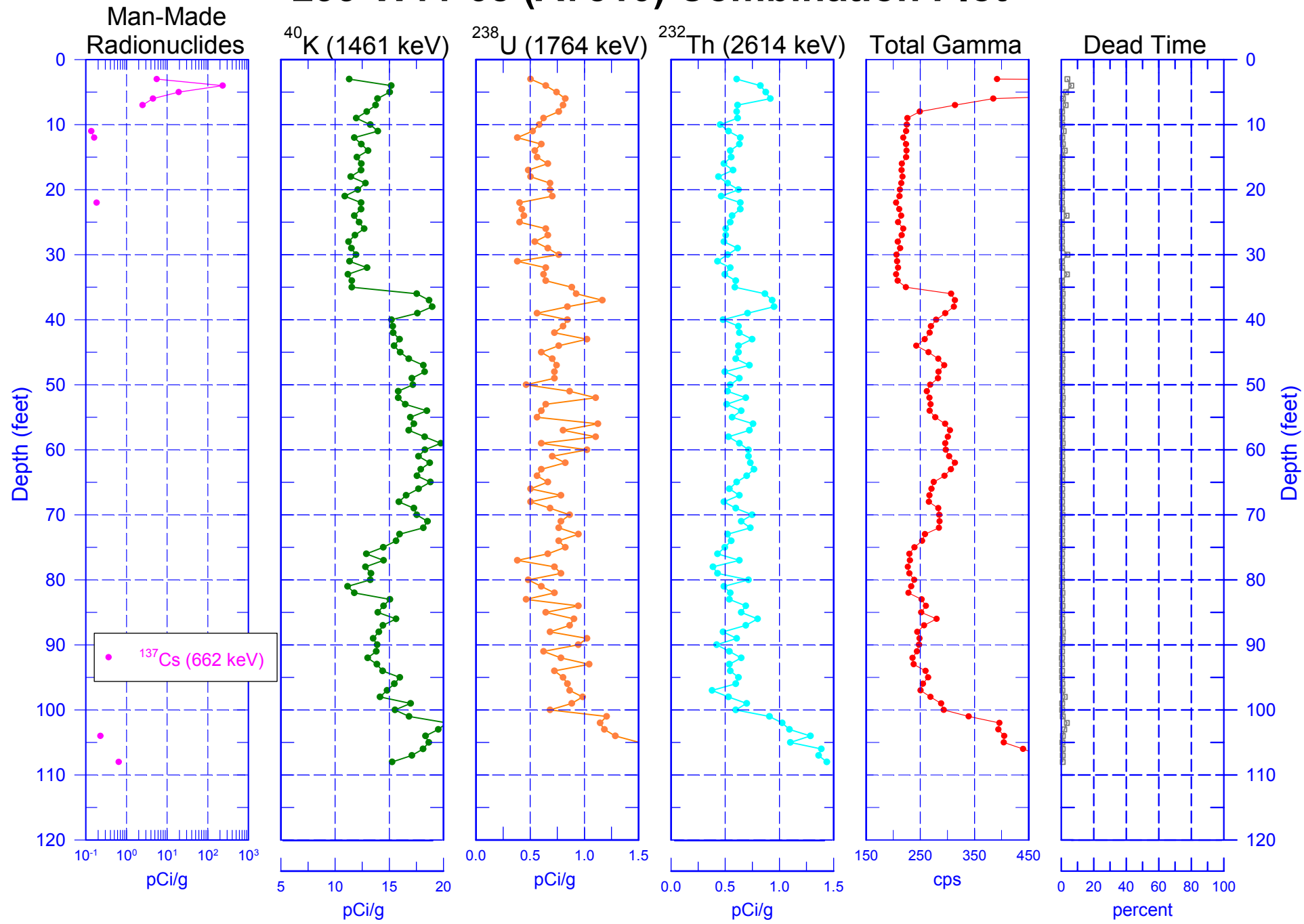
Zero Reference - Top of Casing

299-W11-68 (A7310)
Natural Gamma Logs



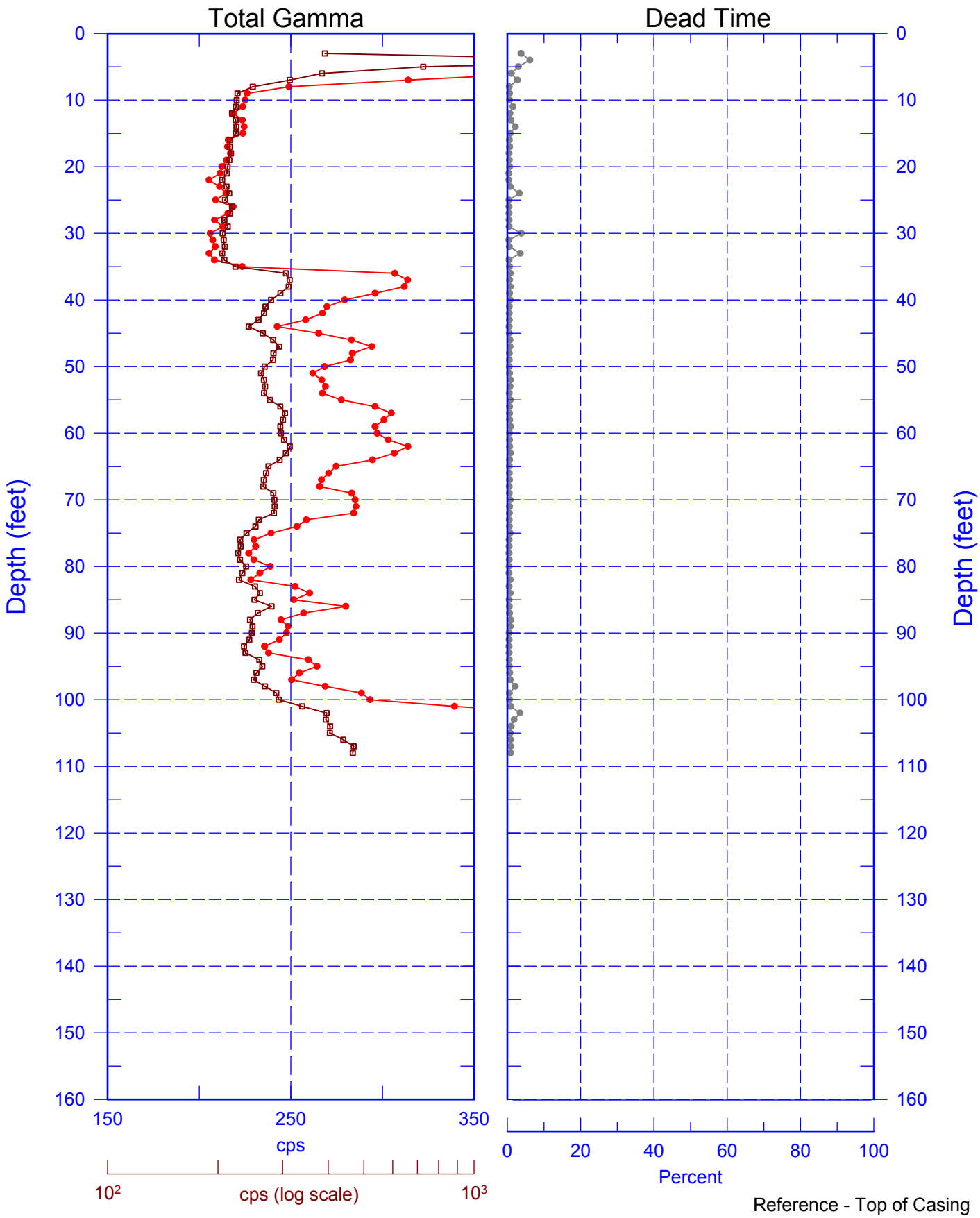
Zero Reference = Top of Casing

299-W11-68 (A7310) Combination Plot

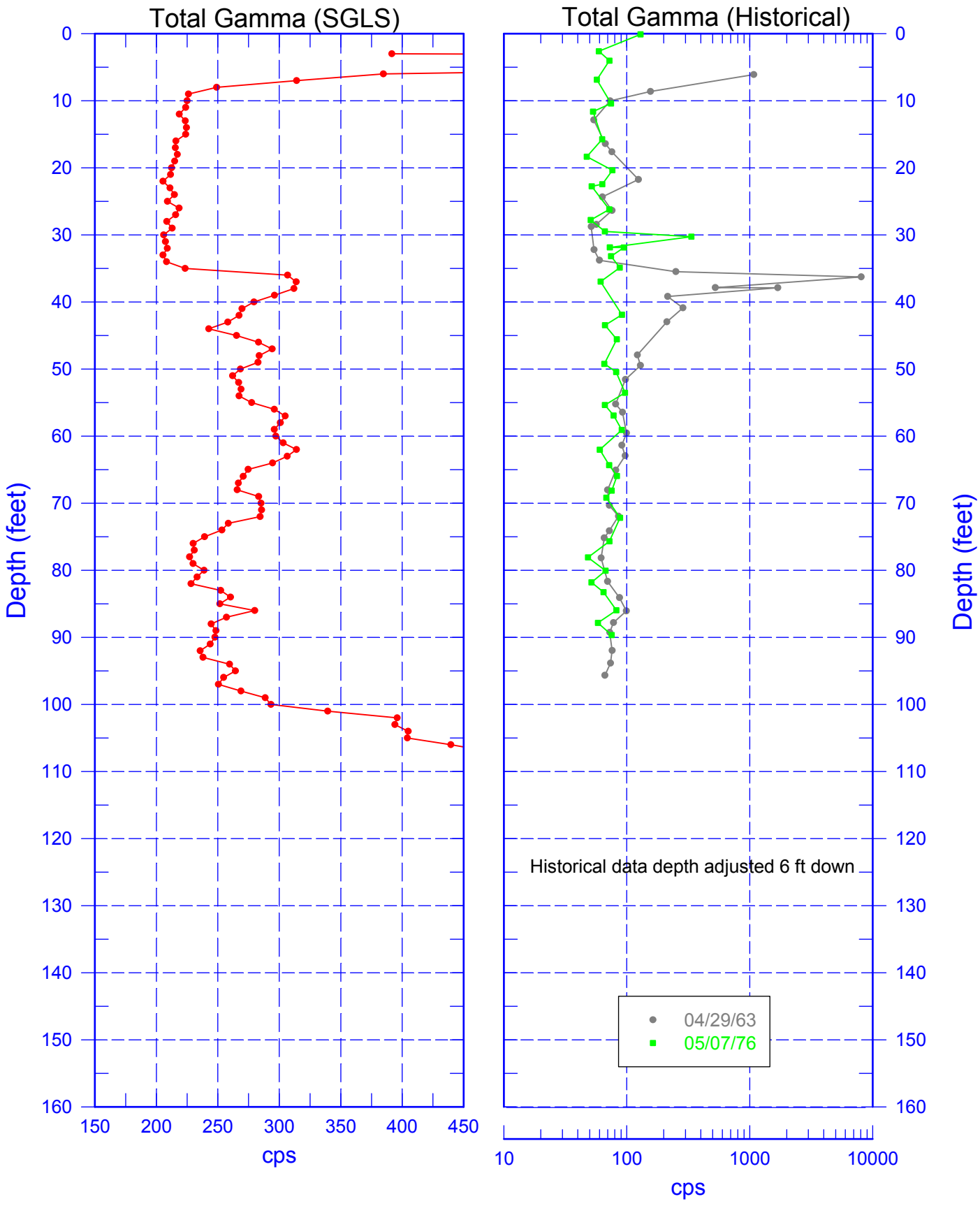


Zero Reference - Top of Casing

299-W11-68 (A7310)
Total Gamma & Dead Time

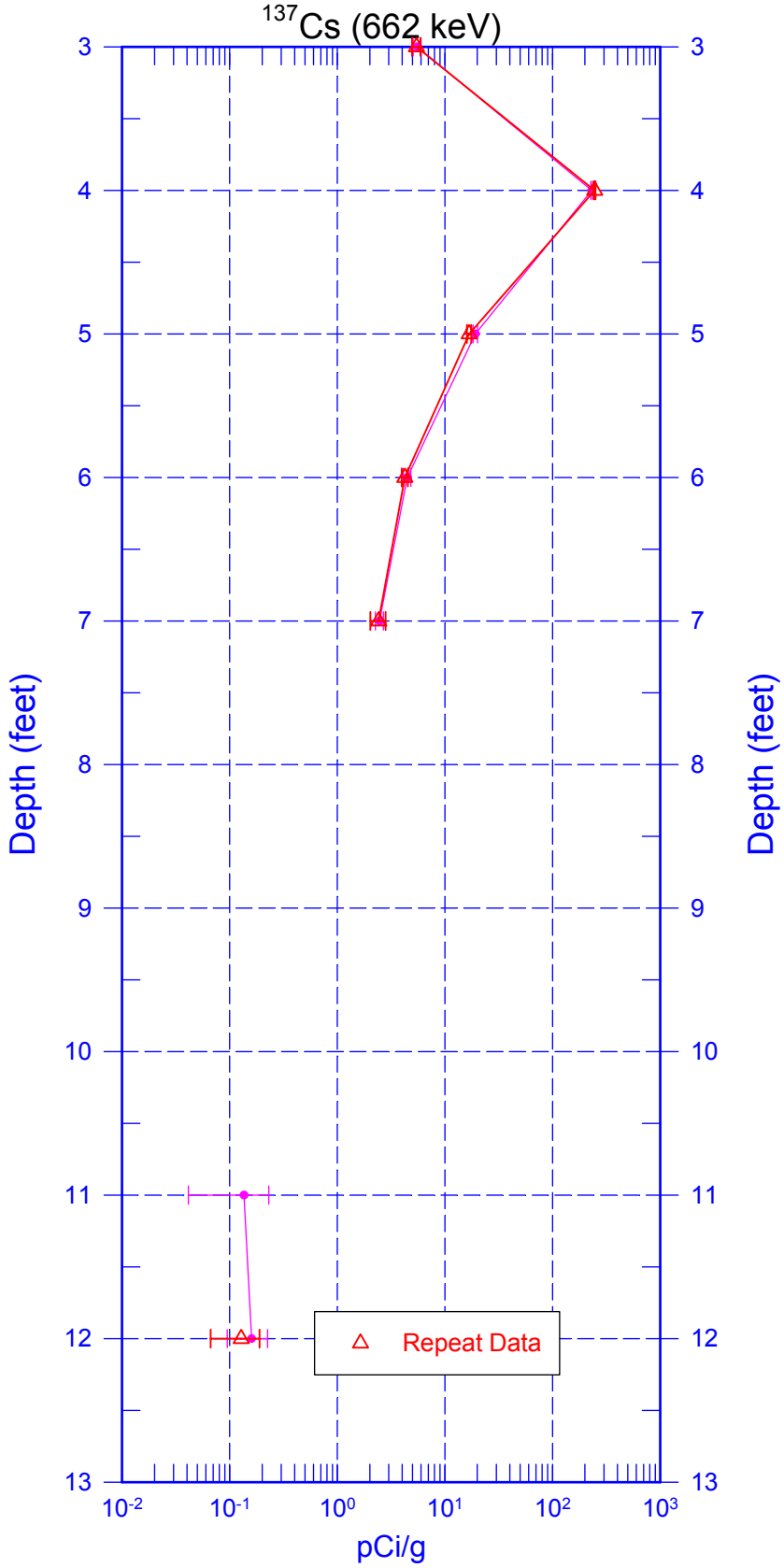


299-W11-68 (A7310)
Comparison of Historical and SGLS Total Gamma



Reference - Top of Casing

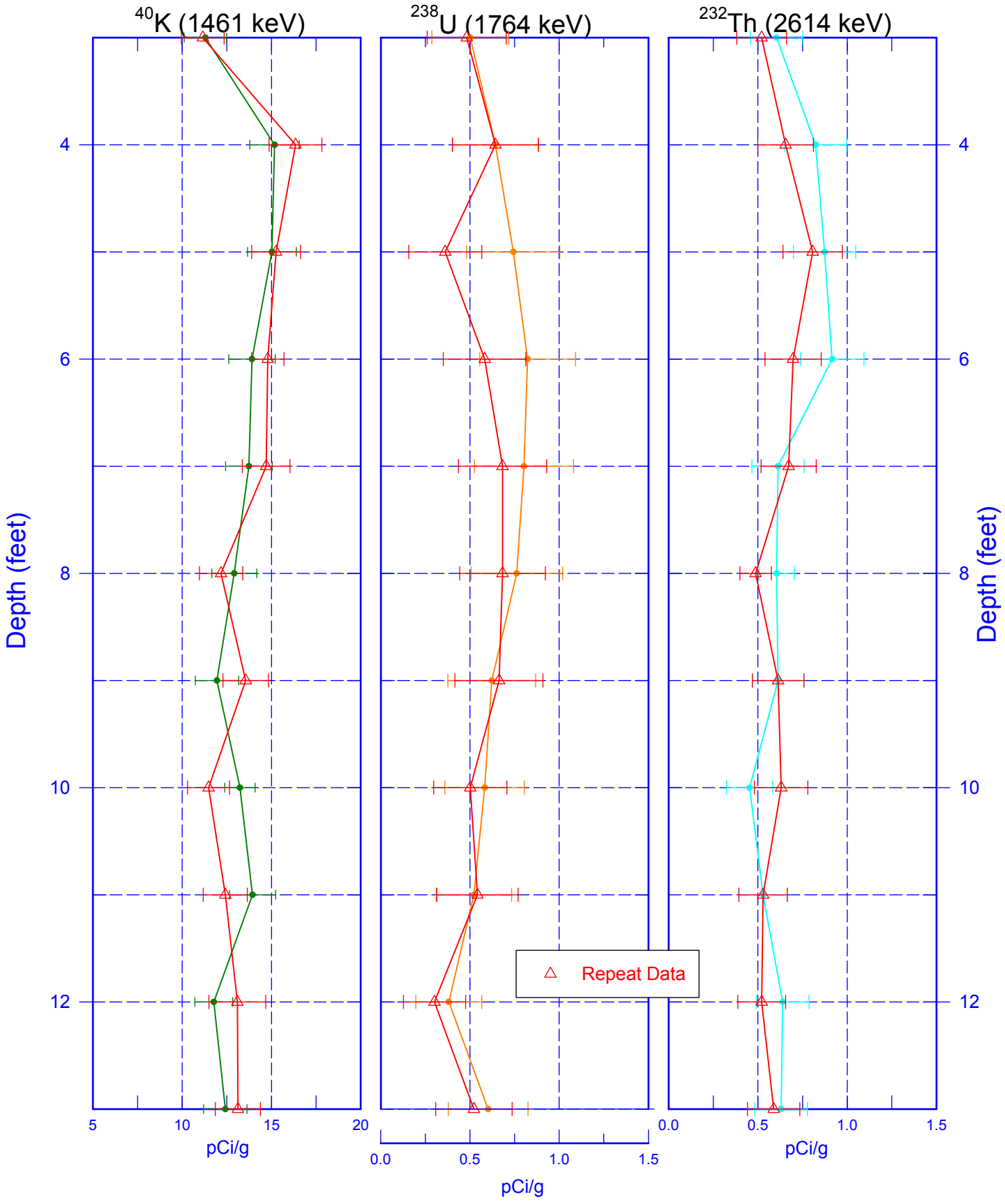
299-W11-68 (A7310)
Repeat of Man-Made Radionuclides



Zero Reference - Top of Casing

299-W11-68 (A7310)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing